He next compares the refraction above deduced, with the results of other astronomers. Piazzi, having an instrument which turns in azimuth, has deduced the actual refractions at all distances from the zenith, by means of numerous observations on Procyon, α Lyræ, and Aldebaran, at various altitudes, from 38° to 89° zenith distance, in addition to several circumpolar stars. Piazzi's result is, that the mean refraction at 45° is 57″·3, which is less by eight tenths of a second than that of the author; but by the present French tables it is stated to be 58″·2, which, on the contrary, is rather greater. But beside the difference in the quantity of mean refraction at 45°, Piazzi observes that the law assigned by Bradley does not obtain; for though the actual refractions, so far as 80° from the zenith, are, in fact, greater than was supposed by Bradley, the refractions within the remaining 10° of the horizon are less than he supposed them to be.

In the series of observations given by the author, a similar want of conformity to Bradley's law is observable; and he observes, that the change of difference, from greater to less, takes place at 80° zenith distance, which is the same point of the heavens assigned by Piazzi.

Mathematicians, who have endeavoured to reconcile the known laws of refraction through different media, with the actual quantity deduced from observation, have proved that the refractions vary nearly as the tangents of zenith distance; but in order to reconcile this rule with the fact at low altitudes, they have found it necessary to introduce a correction of the zenith distance, and have invented a formula, consisting of a tangent of the zenith distance, diminished by some multiple of the refraction. The magnitude of this multiple has been estimated differently by different authors. By Simpson it is rated at 2·75; by Dr. Bradley 3; by Bouguer 3·23; by Cassini 3·226. Mr. Groombridge computes that this multiple should be as much as 3·3625.

In addition to the above endeavours to determine the mean refraction, and its variations at different altitudes, the author also considers the corrections which should be made for the states of the barometer and thermometer, and explains the means by which he deduced those that he has adopted, in order that any error therein may be more easily detected.

Extract of a Letter from the Rev. John Brinkley, *D.D. F.R.S.* Andrew's *Professor of Astronomy in the University of Dublin, to the Rev.* Nevil Maskelyne, *D.D. F.R.S. Astronomer Royal, on the annual Parallax of α Lyræ.* Read April 12, 1810. [*Phil. Trans.* 1810, *p.* 204.]

The principal object of Dr. Maskelyne in making this communication, is to inform the Society of a discovery, made by Dr. Brinkley, of the parallax of the annual orbit, which he has ascertained by observations on α Lyræ.

		Ann. Par.
The first seven observations were made near opposition, the next eight near conjunction.....	The comparison of these gave a result of	2·18
The next set were seven at opposition, and eight at conjunction	giving	3·06
The last set eight at opposition, and eight at conjunction	gave	2·32
	3) 7·56	

So that by the result of 47 observations, the result is 2″·52; and Dr. Brinkley adds, that from the confidence which he has now acquired in his instrument, he has no doubt that the annual parallax exceeds 2″.

This letter also contains some remarks upon refraction with the co-latitude of the Dublin Observatory, as deduced by means of different formulæ. From these it appears, that the agreement by Delambre's tables is nearer than by Dr. Bradley's own formula; but that Dr. Bradley's formula, by means of a slight correction, gives a table preferable to that of Delambre.

Dr. Bradley's is

$$56''\cdot9 \times \text{tang. (zen. dist.} - 3 \text{ Refr.)} \frac{\text{ht. barom.}}{29\cdot6} \times \frac{400}{350 + 6}$$

Dr. Brinkley's corrected formula

$$56\cdot9 \times \text{tang. (zen. dist.} - 3\cdot2 \text{ Refr.)} \times \frac{\text{ht. barom.}}{29\cdot6} + \frac{500}{450 + 6}$$

On the Mode of breeding of the Ovo-viviparous Shark, and on the Aëration of the fœtal Blood in different Classes of Animals. By Everard Home, *Esq. F.R.S.* Read June 7, 1810. [*Phil. Trans.* 1810, *p.* 205.]

With a view to understanding more fully the structure of the Squalus maximus, of which Mr. Home has lately published an account, he has examined with attention that of the Squalus acanthius, which appears to resemble it closely in its internal structure, and has the advantage of being very easily obtained upon the Sussex coast, where it is very common.

After describing minutely the external organs of generation in both male and female, the author traces the progress of the ovaria from the time that the yolks are no larger than peas, till they become as large as walnuts, when they pass into the oviduct. The number of yolks differs in different fish; and even in the same fish Mr. H. has seen five yolks in one ovarium and only two in the other. The oviducts then enlarge, and become exceedingly extended, and divided by contraction of its coats into three cavities, the last of which is ten inches in length, and is that in which the eggs are retained till the young fishes are formed, and capable of taking care of themselves.